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CANNERY LOSSES FOR CLING PEACHES, 1954 SEASON

Sherman Leonard, B. S. Luh, and Jerry Foytik

CALIFORNIA AGRICULTURAL EXPERIMENT STATION
GIANNINI FOUNDATION OF AGRICULTURAL ECONOMICS

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FOREWORD

At the beginning of the 1954 season the Cling Peach Advisory Board requested the University of California to make a study of cannery diversion credits. A pilot plant test, designed to indicate cannery losses incurred at different processing stages, was conducted at Davis by the Department of Food Technology. The results obtained are presented and discussed in this report.

During January 1955 a preliminary report, entitled "Some Information Bearing on Diversion Credits for California Cling Peaches," was submitted to the Cling Peach Advisory Board. This preliminary report described the test, presented the major results, and indicated some further study. It was accepted. The Board, however, neither approved nor disapproved its content or conclusions.

The Cling Peach Advisory Board arranged for peaches to be supplied to the pilot plant located at Davis without cost to the University. Canners making such deliveries received full credit for this tonnage on their diversion reports. The Board also authorized the expenditure of funds which partially defrayed the costs of the project.

Equipment required for the test was furnished on a free use basis, including maintenance parts and instruction, by the following California machinery manufacturers: Atlas Imperial Diesel Engineering Co., Fullerton; Flice and Perelli Canning Co., Richmond; Food Machinery and Chemical Corp., San Jose; and Harter Packing Co., Yuba City.

The project was under the supervision of Sherman Leonard and B. S. Luh, who directed the acquisition, storage, and processing of the peaches utilized in the test and were responsible for maintaining quality control. Jerry Foytik directed the collection, editing, and analysis of the data. The statistical computations were performed largely by Violet Young.

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CANNERY LOSSES FOR CLING PEACHES, 1954 SEASON

by

Sherman Leonard, B. S. Luh, and Jerry Foytik 1/

INTRODUCTION

Cling peaches, grown extensively in California and on only a limited scale in other states, are used mainly for canning. About 85 per cent of the cannery supply goes into straight packs of canned peaches and 15 per cent into mixed packs, particularly fruit cocktail. Canned cling peaches are the most important of canned fruits, making up one-quarter of the total pack in the United States. The farm value of the cling peach crop, totaling some 30 million dollars in recent years, exceeds that of most other fruits grown in California.

Losses during pitting and peeling (including discarded pits) substantially reduce the volume of the peaches reaching the can. Reducing such losses would increase the canner's case yield per ton: Fewer peaches would be required for a given pack--or, conversely, a greater pack would result from a given quantity of peaches. Cannery costs and possibly the consumer price could be reduced.

Twenty years ago peaches were pitted and peeled by hand. Equipment to perform these operations mechanically has been introduced and improved over the years. Each change in technique may alter the proportion of loss experienced by canners. Currently canners are introducing new pitting and peeling machines designed to reduce cannery losses. Its general adoption is of considerable interest and importance to the cling peach industry.

The University of California was requested by the Cling Peach Advisory Board to undertake a study for the purpose of gathering data relating to the appropriateness of diversion credits specified in the Marketing Order governing the canning and freezing of cling peaches in California. A pilot plant test was conducted at Davis during the 1954 season to determine losses

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incurred at various processing stages. This study dealt with three principal problems: (1) How do pitting and peeling losses vary with the type of equipment used for canning peaches? (2) How do such losses vary with the size and maturity of fruit? (3) What shrinkage losses occur during hauling and storage?

The major findings of this investigation, as reported to the industry in January 1955, are:

1. Pitting and peeling losses were closely related to size of fruit, being substantially greater for smaller peaches and lesser for larger fruit.

2. Pitting and peeling losses varied with the equipment used, being considerably less with the torque pitter than with knife and wire pitters and appreciably less with the cup-down peeler than with the immersion peeler.

3. Pitting and peeling losses varied somewhat with maturity--but differently for each machine. Generally, pitting losses were greater for green peaches and lesser for ripe fruit; peeling losses were lesser for green fruit and approximately equal for ripe peaches as for fruit of medium maturity.

4. Appreciable shrinkage losses occurred during hauling and storage.

5. Diversion credits, as provided in the Marketing Order, are somewhat higher than similar credits calculated on the basis of losses obtained by the pilot plant test conducted in 1954.

Twelve varieties of cling peaches were used in the test. Deliveries, totaling 40 tons, were received during the period July 20 to September 13 from all major producing areas ranging from Gridley to Merced. Loss data were compiled on about 200 different lots of peaches handled under controlled experimental conditions.

The peaches were hauled rapidly from the grading station to the pilot plant, and handled rapidly at the plant. Hauling time varied from 1 to 4 hours, averaging 2 1/2 hours. The peaches were stored in the plant at room temperature before pitting and peeling operations commenced. This storage period (overnight) ranged from 10 to 20 hours, averaging 16 hours. All peaches were weighed three times: at the grading station, upon receipt at the pilot plant, and at the beginning of the canning operation.

The peaches were sorted carefully for maturity under a standard light source before pitting. Most lots used in the test were of medium maturity;

some were green; others were ripe. About three-fourths of the lots were graded into six size categories, of diameters varying from 1 7/8-2 3/8 inches to 3 inches and over. The remainder were pitted and peeled without being graded for size.

The various lots of peaches were pitted and peeled with different combinations of equipment. Three pitting machines were used: (1) Pacific rotary peach pitter, (2) Atlas wire pitter, and (3) Filper torque pitter. In this report these machines are identified as the knife pitter, wire pitter, and torque pitter, respectively.

Peeling operations were performed by two machines: (1) cup-down spray lye peeler and (2) immersion peeler. In both cases the peaches moved for one minute through a 1 per cent sodium hydroxide solution at boiling temperature. For the cup-down peeling operation the solution was sprayed over peach halves with the pit cavity down, after which the peach halves were washed by a cool water spray washer. For immersion peeling the peach halves were immersed in the solution and then washed in a drum-rotary washer equipped with the usual type of fan-shaped water sprays.

The rest of this report is in three parts. The first deals with pitting and peeling losses. The second section presents cumulative losses at different stages in the processing operation, including loss in weight during hauling and storage. The third section indicates some conclusions.

PITTING AND PEELING LOSSES

Cling peaches graded into the six size categories as well as peaches ungraded for size were pitted by each of the three pitting machines. The pitted halves and six lots of whole peaches ungraded for size were peeled by the two methods already described. Table 1, pitting losses, and table 2, peeling losses, show the number of lots tested and the average loss experienced for peaches of various sizes (including peaches ungraded for size) when different equipment was used. In addition, when the number of lots used was sufficiently large, the low and high loss figures are shown to indicate the range in losses secured for the bulk (middle two-thirds) of the lots. 1/

Examination of these data reveals two facts. Both pitting and peeling losses are definitely influenced by peach size--increasing as the fruit becomes smaller.2/ And losses are substantially influenced by the type of pitter or peeler used. There were insufficient lots of either large peaches (3 inches and over) or small peaches (1 7/8-2 3/8 inches) to warrant accepting those particular losses shown as representative for those sizes. However, these losses do fit into the general pattern suggested by losses for the intervening sizes.

With all pitters and peelers the large peaches had substantially lower losses than the small fruit. For example, losses with the wire and knife pitters varied from approximately 12 per cent for the smallest size of fruit (1 7/8-2 3/8 inches) to about 8 per cent for the largest size. Similar variations were apparent with the torque pitter and both peelers.

Loss relationships among the various pieces of equipment are also apparent. Losses were significantly lower with the torque pitter than with the other two pitters. For example, with peaches ungraded for size the difference in loss was about 2 1/2-3 percentage points--equivalent to some

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1/ The pitting or peeling losses for all lots of a given fruit size obtained with each machine were arranged in order of decreasing magnitude, from the highest loss to the lowest. The middle two-thirds of these values were used to indicate the typical range in losses. In other words, one-sixth of the lots with highest losses and one-sixth with lowest losses were excluded. For the statistically-inclined reader, this high-low range is roughly equivalent to indicating dispersion about the average by means of the standard deviation.

2/ This result is, of course, the relationship to be expected. The extent by which losses are diminished as larger peaches are processed, however, may be somewhat greater than is often presumed.

TABLE 1

Pitting Losses for Cling Peaches, Pilot Plant Test, 1954 Season

Size of fruit	Filper torque pitter		Atlas wire pitter		Pacific knife pitter	
	percentage loss a/	number of lots	percentage loss a/	number of lots	percentage loss a/	number of lots
	loss for pitting operation b/					
Ungraded for size	7.95 (7-9)	14	10.45 (9.5-11.5)	13	11.05 (10-12)	12
3 inches and over	6.34	2	8.00	3	8.37	3
2 7/8 - 3	7.76	5	9.07 (8-10)	8	9.90 (8-11)	10
2 3/4 - 2 7/8	8.01 (7-9)	11	9.38 (7-12)	13	10.94 (9-12.5)	15
2 1/2 - 2 3/4	7.82 (7-9)	17	11.10 (9-12.5)	19	11.78 (10-13)	20
2 3/8 - 2 1/2	8.60	5	11.21	5	11.64	4
1 7/8 - 2 3/8	11.98	2	11.98	2	11.88	2
	loss for split pits and imperfects c/					
Split pits	4.69 (2-8)	56	5.69 (2.5-9)	63	4.04 (1-6)	66
Imperfects	3.88 (1-7)	56	4.13 (2-6)	63		

a/ Upper figures are average losses for all lots of each fruit size. Lower figures (in parentheses) include the range of the middle 2/3 of losses. This range is not shown when less than seven lots were run.

b/ Exclusive of loss for split pits and imperfects.

c/ Figures relate to all lots, whether or not graded for size.

TABLE 2

Peeling Losses for Cling Peaches, Pilot Plant Test, 1954 Season

Size of fruit	Cup-down lye peeler		Immersion peeler	
	percentage loss a/	number of lots	percentage loss a/	number of lots
	loss on pitted peach halves			
Ungraded for size	6.14 (4.5-7.5)	26	12.45 (9-16)	18
3 inches and over	4.99 (3.5-6.5)	7	8.77	1
2 7/8 - 3	5.15 (4-6.5)	22	9.45	5
2 3/4 - 2 7/8	6.23 (4.5-7.5)	31	11.81 (10.5-13)	8
2 1/2 - 2 3/4	6.19 (4.5-8.5)	40	12.49 (10-15)	21
2 3/8 - 2 1/2	5.89 (4-7.5)	15		
1 7/8 - 2 3/8	8.72	5		
	loss on whole unpitted peaches			
Ungraded for size	4.71	3	3.40	3

a/ Upper figures are average losses for all lots of each fruit size. Lower figures (in parentheses) include the range of the middle 2/3 of losses. This range is not shown when less than seven lots were run.

50 to 60 pounds of fruit per ton of peaches. A similar difference was obtained with the two medium sizes of fruit (2 1/2-2 3/4 and 2 3/4-2 7/8), which made up the largest number of lots tested and the bulk of the peaches canned commercially.

Even greater differences were observed with the peeling operation. For most fruit sizes the loss was about half as large with the cup-down peeler as with the immersion peeler. The difference, averaging some 5 percentage points, represents about 100 pounds per ton.

The magnitude of variations in pitting and peeling losses obtained in the pilot plant test during the 1954 season is shown in figure 1. Results are plotted separately for six sizes of cling peaches. Losses experienced with the three pitters appear in panel A and those with the two peelers are shown in panel B.

Imperfectly pitted fruit and peaches with split pits were removed after the pitting operation.1/ The pitting losses reported are computed on the remaining fruit. In the case of the wire and torque pitters, separate percentages (by weight) were determined for imperfectly pitted fruit and for peaches with split pits. However, there were so few unpitted split pits with the knife pitter that a separation was not attempted. These losses are shown at the bottom of table 1.

Approximately the same percentage of imperfect fruit was obtained with each of the three pitters. The torque and wire pitters, however, also resulted in a substantial loss for split pits. Hence the combined loss for split pits and imperfects was less than half as large with the wire pitter as with the other two pitters.

The data on losses were also examined to determine the influence of maturity on pitting or peeling losses. Since most of the peaches were of medium maturity, there were only 38 lots of either green or ripe fruit scattered among the various size categories. This is not sufficient to permit calculating separate average losses for different maturities. However,

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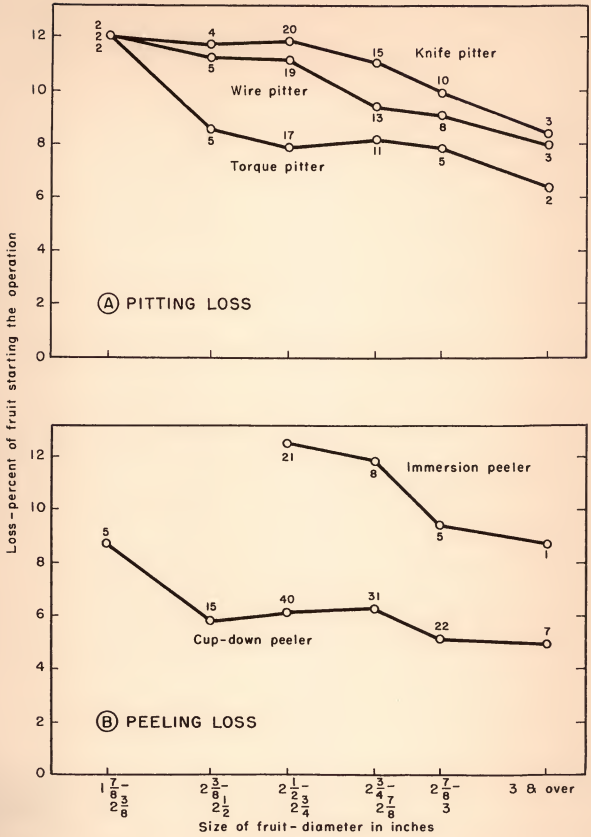
1/ Imperfect fruits are those that cannot be canned as halves and thus will normally be sliced, diced, or pulped after trimming. These imperfections can result from a number of factors, such as character and quality of the peach, imperfect operation of the machine, and improper handling of the machine by the operator.

Figure 1

PITTING AND PEELING LOSSES FOR CLING PEACHES, BY FRUIT SIZE AND EQUIPMENT USED, PILOT PLANT TEST, 1954 SEASON



Note: Figures adjacent to points indicate the number of lots used for determining the average losses plotted.

the general effect of maturity can be indicated.[1/]

These results, appearing in table 3, indicate that only with knife and wire pitting does maturity have a definite and pronounced influence upon the magnitude of losses encountered. With these pitters about half the lots of green peaches had a high loss, half an average loss, and none a low loss. Two-thirds of the losses for ripe peaches were low and one-third average--only one of the fifteen lots had a high loss. With the torque pitter, however, losses for both green and ripe peaches were comparable to those obtained for fruit of medium maturity.

There was no tendency for the peeling loss for ripe peaches to be different from that for fruit of medium maturity. Green peaches, however--especially with the immersion peeler--had a considerably lower peeling loss.

Only a small number of determinations were made on green and ripe peaches. The results, although inconclusive, do suggest that maturity may be a factor influencing cannery losses, especially with wire and knife pitting. Further study is necessary to establish whether these indications are descriptive of an actual underlying relationship.

1/ The pitting or peeling losses for all lots of medium maturity of a given fruit size obtained with each machine were arranged in order of decreasing magnitude, from the highest loss to the lowest. These were divided into three groups containing equal numbers of lots, to indicate the top third, middle third, and bottom third of losses for medium maturity. Then each lot of green peaches and ripe peaches was identified as having high, average, or low loss by comparison with the scale of losses for lots of medium maturity. The results so obtained were combined disregarding fruit size in order to reveal the relationship prevailing between maturity and magnitude of loss.

TABLE 3

Pitting and Peeling Losses in Relation to Maturity, Pilot Plant Test, 1954 Season

Magnitude of loss [a]	Green peaches	Ripe peaches
	number of lots	
Knife pitter		
High	4	1
Average	3	3
Low	0	7
Wire pitter		
High	3	0
Average	3	2
Low	0	2
Torque pitter		
High	2	1
Average	2	0
Low	3	1
Immersion peeler		
High	0	1
Average	1	2
Low	7	2
Cup-down peeler		
High	2	2
Average	6	6
Low	7	3

[a] "High," "Average," and "Low" refer to a loss included within the top third, middle third, and bottom third of losses for medium maturity.
The determination of the magnitude of loss for green and ripe peaches is explained in the footnote appearing on page 9.

CUMULATIVE LOSSES

To show the cumulative loss experienced for getting peaches from the orchard to each of the various processing stages requires making an additional allowance for losses in weight that take place while the peaches are hauled from the grading station and stored at the plant prior to pitting. For the test lots an average shrinkage loss of 2.7 per cent was observed. This included losses of 1.4 per cent for the average haul of 2½ hours and 1.3 per cent for overnight storage of 16 hours at room temperature. Table 4 indicates that shrinkage losses increase as hauling and storage times are increased.

These shrinkage losses relate to the 1954 pilot plant test and may not be representative of normal commercial operations. Peaches obtained for the test were hauled promptly from the grading station to the plant, and handled rapidly at the plant. The average elapsed time is considerably less than for peaches canned commercially. Representative losses could not be indicated, however, even if the tests had included lots hauled more slowly and stored for longer periods. Typical times involved in getting peaches from the grading station to the pitting machine are not known.

Certain other factors may have contributed to low shrinkage losses for the test lots: The field boxes were stored in small stacks. Losses were not determined for peaches held in cold storage. The season was cool.

Total losses during the pitting and peeling operations, i.e., beginning with peaches available at the pitting machine, can be determined for various combinations of machines and for different fruit sizes. For illustrative purposes it will suffice to compare losses on peaches ungraded for size for two equipment combinations: (1) the knife pitter followed by immersion peeling and (2) the torque pitter followed by cup-down peeling.

These particular combinations represent equipment showing the highest and lowest loss experience, respectively, in the pilot plant test. They also contrast an equipment line currently used by commercial canners with a line that may be introduced extensively within the next few seasons. Thus the comparison serves to indicate a reduction in losses that may occur in the near future as the industry converts to using pitters and peelers with

TABLE 4

Shrinkage Losses, Pilot Plant Test, 1954 Season

Magnitude of loss a/	Elapsed time (hours)	Percentage loss
Hauling, grading station to plant		
Low	1	0.83
High	4	1.85
Average	2.5	1.40
Storage, at pilot plant		
Low	10	1.00
High	20	1.50
Average	16	1.32
Combined shrinkage, hauling and storage b/		
Low	11	1.82
High	24	3.32
Average	18.5	2.70

a/ "Low" and "High" refer to bottom and top ends of the range including the middle 2/3 of losses for individual lots "Average" refers to all lots.
The determination of the range in losses for the bulk of the lots is explained in the footnote appearing on page 4.

b/ The combined shrinkage loss is determined in the manner explained in the footnote on page 14. Of each 100 pounds of peaches received at the grading station, 98.60 pounds are delivered at the plant (hauling loss is 1.4 per cent). The storage loss is 1.30 pounds--1.32 per cent of 98.60 pounds. Thus the combined shrinkage is 1.70 per cent, consisting of 1.40 for hauling plus 1.30 for storage.

lower cannery losses.1/

Actual losses incurred during the test are to be compared with losses allowed under the marketing order governing the canning and freezing of cling peaches in California. It is well, therefore, to indicate briefly how diversion credits are utilized. The order establishes a schedule of diversion credits. These are used for determining the tonnage of unprocessed or partly processed peaches that each processor must divert to be "equivalent to the weight of Off-Grade Cling Peaches delivered to such processors." By expressing these credits as equivalent losses direct comparisons can be made between the losses experienced during the test and those allowed by the order.2/

1/ The relative volume of peaches run over knife and wire pitters or over immersion and cup-down peelers is not known. However, the point here is not to select the equipment combination representing the greatest volume of fruit but merely one which is in common use.

Comparisons are indicated for peaches ungraded for size. Approximately the same results are derived from pitting and peeling losses for either of the two medium sizes, which represent the largest number of lots tested and the bulk of the peaches canned commercially.

2/ Since 1937 canning of California Cling peaches has been regulated by marketing orders issued by the Director of Agriculture pursuant to provisions of the California Marketing Act of 1937, as amended. The program is designed to restrict the supply of canned and frozen cling peaches to "reasonable market requirements." A Cling Peach Advisory Board, composed of 11 producer and 11 processor members, is established to assist the Director in administering the order.

The current "Marketing Order for Canning and Freezing Cling Peaches," effective from March 30, 1954 to June 30, 1957, permits the use of an advertising and sales promotion program and four methods of controlling supply. Section F-3, Article VI, provides that the quantity of peaches diverted shall be "equivalent to the following percentages of cling peaches in their natural state at the time of delivery to a receiving station or processing plant:"

100 per cent for whole unpeeled peaches,
110 per cent for whole peeled peaches,
118 per cent for pitted peach halves, and
145 per cent for pitted and peeled peach halves.

Some industry members questioned the appropriateness of the diversion credits. The request for a study during 1954 resulted.

This comparison appears in table 5. The first set of figures gives the diversion credits specified in the order and the equivalent losses. The remaining data indicate actual losses for the two equipment combinations mentioned above. For each combination cumulative losses are shown for low, average, and high losses due to shrinkage, pitting, and peeling.1/

The combined loss for torque pitting followed by cup-down peeling was approximately one-third less than for the knife pitting-immersion peeling sequence. This reduction in loss, averaging 8 percentage points, means that a ton of fruit yielded an additional 160 pounds of peaches ready for the can. For both equipment combinations cumulative losses based on lots with high pitting and peeling losses were almost 50 per cent greater than those for lots with low pitting and peeling losses.

1/ Possibly a further explanation of these figures is in order. The cumulative loss is not merely an addition of losses to that point in the canning operation. Instead, each loss is applied to the weight remaining after allowing for preceding losses. For example, the average loss for pitted and peeled halves (15.94 per cent) using the torque pitter and cup-down peeler is derived as follows:

100.00	pounds of peaches delivered at the receiving station
2.70	pounds of shrinkage due to hauling and storage (2.70 per cent)
97.30	pounds of peaches available at start of pitting operation
7.74	pounds of loss during pitting (7.95 per cent, per table 1)
89.56	pounds of pitted peach halves at start of peeling operation
5.50	pounds of loss during peeling (6.14 per cent, per table 2)
84.06	pounds of pitted and peeled halves ready for the can.

Thus the cumulative percentage loss is 10.44 (100 - 89.56) on pitted peach halves and 15.94 (100 - 84.06) on pitted and peeled peach halves.

TABLE 5

Actual Losses for Cling Peaches Ungraded for Size, Pilot Plant Test, 1954 Season Compared with Diversion Credits and Losses Allowed by Marketing Order

Magnitude of loss a/	Whole peaches		Peach halves	
	unpeeled	peeled	pitted and unpeeled	pitted and peeled
Authorized by Marketing Order				
Diversion credits	100	110	118	145
Equivalent loss	0.00	9.09	15.25	31.03
Actual loss for knife pitting and immersion peeling				
Low	1.82		11.64	19.59
High	3.32		14.92	28.53
Average	2.70	6.01	13.45	24.30
Actual loss for torque pitting and cup-down peeling				
Low	1.82		8.69	12.80
High	3.32		12.02	18.62
Average	2.70		10.44	15.94

a/ "Low" and "High" refer to bottom and top ends of the range including the middle 2/3 of losses for individual lots. "Average" refers to all lots.
All figures represent the percentage of cling peaches in their natural state at time of delivery to a receiving station.
The determination of the range in losses for the bulk of the lots is explained in the footnote appearing on page 4.

CONCLUSIONS

This investigation was limited in scope. Loss data were gathered on a relatively small volume of fruit--only 40 tons. The peaches used for the test may not represent a true cross-section of all peaches canned. Normally canners may experience higher shrinkage losses in hauling peaches from grading stations and in storing them prior to pitting than those observed for test lots in 1954. Substantially different pitting and peeling losses may exist for actual commercial operations.

These limitations do not, however, negate the validity of the results. It is possible to indicate the differences in losses generally prevailing. For peaches used in the test, pitting and peeling losses varied substantially with equipment and with fruit size, and to a lesser extent with maturity. Although the magnitude cannot be specified exactly, a sufficient number of lots was tested to provide reliable indicators of the relationship to be expected for commercial operations.

Nevertheless, the results, unsupported by other information, are insufficient for indicating what changes, if any, should be made in the schedule of diversion credits currently used. For example, information is required to reveal the degree of correspondence between losses incurred under both experimental and commercial conditions. The relative volume of peaches pitted and peeled by different machines is also needed to permit determining average losses for pitting and peeling that would be representative of the entire canning industry.

Last year's findings, however, can serve as the basis for designing a second investigation to indicate how diversion credits should be altered so that the schedule corresponds with losses actually experienced by the canning industry. Such an additional study would include:

(1) A second and somewhat larger run of fruit through an experimental pilot plant, using a wide range of controlled conditions;

(2) A sample determination of losses incurred concurrently during actual commercial operations by a group of canneries; and

(3) An industry survey to determine certain facts required to permit deriving industry average losses--length of hauls (from receiving station to plant), storage period and conditions, equipment used by canners, and distribution of fruit sizes.

If diversion credits are to reflect actual losses accurately, periodic review of the schedule is inevitable. A revision might be made, or at least considered, each time technological innovations gave rise to substantial changes in cannery losses. The current introduction of new pitting and peeling equipment could be such an occasion. Its general adoption, by decreasing cannery losses sharply, would be significant for at least two additional reasons.

Any substantial alteration in the processing technique employed may affect quality of the canned products. Any large reduction in pitting and peeling losses, by increasing the case yield, may have important economic repercussions. Examination of these two facets of the problem requires separate study. Their importance, however, can be indicated.

During the 1954 test a limited selection of samples of peaches of different sizes pitted and peeled with various machines was canned. This was done to permit comparison of quality of peaches subjected to different processing techniques. Chemical analyses and taste tests indicate that quality differences do exist. More work is necessary, however, before it will be possible to state how much quality and consumer acceptance are affected by a change to the new pitters and peelers.

A decrease in cannery losses means that fewer peaches are required for each million cases packed. This implies reduced cannery costs, due mainly to lower expenditures for the fruit going into each can and for the direct labor used in processing. Whether demand for cling peaches at the grower level will expand depends upon answers to three questions: What will be the influence of the technological change on the quality of peaches and fruit cocktail canned? What will be its effect on retail prices? How will any change in quality or price affect consumption?

To summarize, the work undertaken in 1954 indicates the relative magnitude of cannery losses incurred at various processing stages and the factors producing variations. This investigation does not, however, complete the study. Additional research is required to reveal the influence on quality and demand arising from changes in processing methods, such as those currently being introduced by California canners of cling peaches.